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Note: This resource management strategy focuses primarily on private land, including cultivated land, rangeland, and forest land. It is not intended to provide a critique of contemporary agricultural practices. Neither is it intended as a guide to specific practices. This chapter presents strategies that can be incorporated into regionally relevant adaptive management of agricultural land. Further, while irrigated cropland cultivation is addressed, as a land intensive endeavor, livestock grazing is a land extensive endeavor, occurring on more than 16 million acres of privately held land in California, influencing both surface hydrology and groundwater recharge. Additional information about forest land can be found in the Forest Management Resource Management Strategy.

> "…'Agricultural land stewardship' means farm and ranch landowners—the stewards of the state's agricultural land—producing public environmental benefits in conjunction with the food and fiber they have historically provided while keeping land in private ownership." — California Water Plan Update 2005, Agricultural Land RMS.

Agricultural land stewardship broadly means the conservation of natural resources and protection of the environment. Land managers practice stewardship by conserving and improving land for food, fiber and biofuels production, watershed functions, soil, air, energy, plant and animal and other conservation purposes. Agricultural land stewardship also protects open space and the traditional characteristics of rural communities, as well as open space within urban areas. Moreover, support for public benefits from stewardship activities helps landowners maintain their farms and ranches rather than being forced to sell their land because of pressure from urban development.

Agricultural land stewardship will continue to be a leading priority in the implementation of California Water Plan Update 2009. Working landscapes will increasingly be relied on for flood management and water storage and conservation, as well as to provide critical habitat at key locations and sequester carbon, while maintaining ongoing primary productivity of food and fiber. It is also anticipated that difficult decisions will need to be made to sacrifice some productive agricultural land to ecological functions, in order to fulfill the goals of reliable water supplies and functional ecosystems. Conversion of agricultural lands to other uses (e.g. urban, industrial), can compromise a landscape's ability to provide ecosystem services to the public.

Since the California Water Plan Update 2009, new assistance programs, as well as laws and regulations affecting agricultural land stewardship, have been created or enacted, and old ones eliminated, reduced, or expanded. Some of the key policies and initiatives are listed below.

Federal:

- Federal Farm Bill reauthorization.
- US Fish and Wildlife Service, Partners for Fish and Wildlife Program (http://www.fws.gov/cno/partners/)

- Natural Resources Conservation Service (NRCS) Agricultural Water Enhancement Program (AWEP), a part of the Environmental Quality Incentives Program (EQIP) (http://www.ca.nrcs.usda.gov/programs/awep.html)

State:

- AB 32 Greenhouse Gas Reduction Act Climate Action Team Ag Work Group (AgCAT).
- The California Department of Transportation-led Regional Blueprint (http://calblueprint.dot.ca.gov/)
- The Governor's Strategic Growth Plan/Strategic Growth Council. (http://www.sgc.ca.gov/)
- New agency programs since 2005 that support Agricultural Land Stewardship, such as the Wildlife Conservation Board's Ecosystem Restoration on Agricultural Lands (ERAL) program. (http://www.wcb.ca.gov/Pages/eral_project.asp) Many new programs were made possible by enacted bond measures discussed above.
- The San Joaquin Valley Blueprint. (http://www.valleyblueprint.org/)

Non-governmental organizations:

- Ag Innovations Network-convened county-level Food System Alliances, California Roundtable on Water and Food Supply, and the California Roundtable on Agriculture and the Environment. (http://www.aginnovations.org)
- American Farmland Trust California Chapter (http://farmland.org/california)
- Audubon California Land Owner Stewardship Program (http://ca.audubon.org/lsp/)
- The California Agricultural Water Stewardship Initiative, a project of the California Roundtable on Water and Food Supply. (http://www.agwaterstewards.org)
- The California Dairy Quality Assurance Program. (http://www.cdqa.org/)
- The California Rangeland Water Management Plan
- The California Rangeland Conservation Coalition. (http://www.carangeland.org/)
- Community Alliance with Family Farmers. (http://www.caff.org/)
- Fish-Friendly Farming sponsored by the California Land Stewardship Institute. (http://www.fishfriendlyfarming.org/)
- Mokelumne Watershed Environmental Benefits Program. Environmental Defense Fund and Sustainable Conservation (http://www.edf.org/sites/default/files/mokelumne-program-description.pdf)
- Roots of Change. (http://www.rocfund.org/)
- The Pacific Institute. (http://www.pacinst.org/)
- The Sacramento River Conservation Area Forum. (http://www.sacramentoriver.org/SRCAF/index.php)
- Sustainable Conservation (http://www.suscon.org)
- Wild Farm Alliance. (http://www.wildfarmalliance.org/)
- Other agricultural production groups' environmental stewardship initiatives, such as the California Association of Winegrape Growers Sustainable Winegrowing Program; the California Rice Commission's Conservation Program. (http://www.cawg.org/, http://www.calrice.org/a6c_conservation.htm)

Agricultural Land Stewardship in California

Agricultural land in California comprises about 31.6 million acres (California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program 2008).

About 12.4 million of these are cultivated, while the remaining 19.2 million acres are rangeland. Agricultural land includes both cultivated and non-cultivated land used for production of plant and animal products. . Stewardship of this land requires constant balancing between market forces, natural constraints and ever-changing social expectations. In describing this dynamic, Giannini Foundation's Special Report 04-1, "Whither California Agriculture: Up, Down, or Out?" lists seven persistent elements that have shaped California Agriculture over the last 240 years (formatting added):

> *First*, California agriculture has always been "demand driven." It was never subsistence, family-farm agriculture like that which characterized much of early United States agriculture (Cochrane, 1993); rather, it was driven by entrepreneurs seeking riches by serving high-value and/or newly emerging markets. These markets were generally distant and often foreign: hides and tallow to the United Kingdom and Boston; wheat to Europe and beyond; fruits, nuts, and vegetables to the East Coast, Europe, and, more recently, Asia; and wine to the world.
>
> *Second*, California agriculture is resource-dependent (land and water). Its history includes aggressive development of new land and water resources along with cases of soil and groundwater exploitation—the nature and severity of which has changed over its history.
>
> *Third*, California agriculture has been shaped by the absence of water in the right place. It has always been in search of more water and has been an aggressive participant in water debates (wars?) with both internal and external competing interests.
>
> *Fourth*, California agriculture has always depended on a large supply of agricultural labor for cultivating and harvesting its abundant produce from both relatively large-scale operations and specialty-crop farms. The source of a stable supply of field labor has varied over time with immigrants from Asia and the Americas.
>
> *Fifth*, California agriculture has grown rapidly and almost continuously, although it has been periodically buffeted by natural catastrophes (e.g., floods, droughts) and adverse economic shocks (e.g., the Great Depression, various recessions).
>
> *Sixth*, California agriculture, at least since the Gold Rush, has required very high levels of management skills—both technical and economic. It has always been dominated by large-scale operations that have grown in complexity and sophistication.
>
> *Seventh*, it has always been on the technological frontier in developing, modifying, or stealing new technologies, such as large-scale mechanical technology, irrigation equipment, horticulture/plant varieties, pest control, food processing, and wine making."

Institutions and policies have been developed in response to these challenges. Public investment in water infrastructure (reservoirs, canals, drains, levies, dykes) has been in the forefront of these.

California Land Conservation (Williamson) Act of 1965: Underscoring the economic importance of agricultural land, California lawmakers enacted the California Land Conservation Act of 1965 (Williamson Act) in order to protect agricultural land and open space from premature conversion to urban uses. The Williamson Act program, administered through the California Department of Conservation (DOC) Division of Land Resource Protection (DLRP), provides economic incentives to counties to promote land use planning decisions which conserve farmland to the greatest extent feasible. About 16 million acres, roughly half of the farmland in California (cropland and rangeland), is covered by long-term contractual protections under the Williamson Act.

Article 13, Section 8 of the California Constitution restricts taxation of open space land, including farmland, to promote conservation, preservation, and continued existence of this necessary resource.

The Watershed Coordinator Grant Program, also administered by DLRP, supports projects implementing water conservation, working with private land for watershed health, erosion and public education for water quality, best management practices, science and planning in watershed management, and working with landowners, building relationships, to build better, healthier watersheds. Permanent protection of farmland through agricultural easements is partially funded by matching fund grants administered by DLRP. Other institutions supporting agricultural land stewardship include Resource Conservation Districts (RCDs), University of California Cooperative Extension offices (UCCE), Natural Resource Conservation Service field offices (NRCS), county Agriculture Commissioners, and the California Department of Food and Agriculture.

The size and terrain of California allows for a diverse agriculture sector that includes extensive and intensive systems. This comes with costs, not the least of which are the large amounts of capital and land needed for water capture, storage, transport, and disposal (i.e. Lower Klamath Lake; Salton Sea). Other resource management strategies requiring significant land resources may be compatible with or conflicting with ongoing agricultural uses. Among these are: Flood Management; Ecosystem Restoration; Watershed Management; Forest Resource Management, Economic Incentives; Water Transfers; Agricultural Water Use Efficiency; and Urban Land Use Management. This narrative will discuss overlap with some of these other strategies.

Agricultural Land Stewardship Approaches

There are many ways that agricultural land can provide conservation benefits and be profitably managed. Cropland and rangeland can be managed to reduce or avoid streambank erosion or storm water runoff. Streambank stabilization may include a buffer strip of riparian vegetation which slows bank erosion and filters drainage water from the fields. Measures such as these can minimize or reduce the effects of agricultural practices on the environment and help meet governmental regulatory requirements while also reducing long-term maintenance problems for the landowner and providing environmental co-benefits.

Agricultural land stewardship is not a new concept. Under various names, it has been practiced by many farmers and ranchers and encouraged by the California Department of Conservation's programs and the US Department of Agriculture (USDA) through the Natural Resource Conservation Service and various

nongovernmental entities for many years. The California Resource Conservation Districts (RCDs), and other entities, specialize in working with private landowners in watershed management and coordination strategies. Governmental land acquisition programs do not constitute agricultural stewardship when they take farm land out of production. These programs are limited, as they now can affect only a small portion of agricultural land. Still, stewardship is increasingly considered by governmental and nongovernmental organizations for protecting natural resources while keeping the land in productive private ownership.

California's 16.5 million acres of privately held rangeland strongly differ from cropping systems in their impacts on water, and the management strategies to enhance water quality and quantity. Eight of California's 12 major drainage basins are dominated by vegetation types that are commonly grazed. rangeland, which occurs on roughly twenty ecosystems in California, with a rich diversity of species. Two-thirds of the major reservoirs in the state are located on public and private rangeland. The location of rangeland, between the forested areas and major river systems, means that almost all surface water in California passes through rangeland. Rangeland in California acts like a sponge capturing, filtering and releasing precipitation runoff slowly so it can be used for urban, recreational, agriculture and environmental uses. With climate change models predicting less precipitation as snow and more as rainfall, the ability of rangeland to maximize capture and minimize runoff of precipitation becomes increasingly important. Compared with other agricultural land uses, healthy rangeland has the capacity to decrease erosion. Plant root systems form dense mats that effectively serve as filters to remove contaminants before they can seep into the groundwater. Rangeland plays a key role in ensuring watershed function in California. Ranchers can contribute to improved water supply and quality in streams and rivers through adaptive management practices. Benefits of those practices contribute to improving water quality and water yields, wildlife habitat co-benefits that improve biodiversity, and improved agricultural productivity. Investment in green infrastructure through rangeland conservation programs that aim to secure beneficial land uses through conservation easements and best management practices, in order to protect both water supplies and water quality, is a cost-effective way of protecting and maintaining healthy watersheds in California. A recent publication from the Natural Resources Conservation Service provides the additional background on the practices and benefits of rangeland management. (Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps. Briske, D.D., editor. {2011}. Conservation Benefits of Rangeland Practices: Assessment, Recommendations, and Knowledge Gaps. United States Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/ceap/?&cid=stelprdb1045811) Rangeland and cropping systems differ in their management approaches. Future Water Plan updates may present a strategy for agricultural land stewardship that is separate from stewardship of rangeland.

A range of private and public programs and initiatives already exist that fit the stewardship model (see Box 20-1). Many public programs provide technical assistance on what crops to plant, and how to plant, cultivate and irrigate them. Similarly, in rangelands, these programs enhance water quantity and quality, and other ecosystem services by providing information on grazing intensity and timing, and strategies for fencing and developing infrastructure to provide water to livestock. Other programs provide technical help on wildlife-friendly farming and ranching techniques for terrestrial and aquatic ecosystems. Additional types of programs cover soil, water, and habitat conservation planning. These efforts can identify suitable areas for farming and habitat management, and identify key rangelands and croplands that should be protected from development, due to the multiple services they can provide. Urban planning programs can also be used to avoid agricultural land fragmentation and permanent loss of valuable

agricultural land because of urban development (see the urban land use management strategy). And finally, there are programs that limit or cease commercial agricultural use to promote wetlands and other wildlife sensitive areas, while keeping land in private ownership and stewardship.

PLACEHOLDER Box 20-1 Initiatives that Exemplify Agricultural Land Stewardship Strategy

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

The following examples describe a range of stewardship programs.

Butte County Resource Conservation District,
Department of Conservation
Watershed Coordinator Program
Oaks and Groundwater Outreach
RCD: (530) 534-0112; www.buttecountyrcd.org

Central Modoc Resource Conservation District,
Department of Conservation
Watershed Coordinator Program
Working with Private Lands for Watershed Health
RCD: (530) 233-8872; www.cmrcd.org

Coastal San Luis Resource Conservation District,
Department of Conservation
Watershed Coordinator Program
Water Quality and Conservation
RCD: (805) 772-4391; www.coastalrcd.org

Colusa County Resource Conservation District
Department of Conservation
Watershed Coordinator Program
Local Partnerships are Critical to Program Success
RCD: (530) 458-2931; www.colusarcd.org

Contra Costa Power and Water District
Department of Conservation
Watershed Coordinator Grant Program
Water Quality and Best Management Practices
District: (925) 313-2313

El Dorado Irrigation District
Department of Conservation
Watershed Coordinator Grant Program
Science and Planning in the Watershed
District: (530) 642-4007

Glenn County Resource Conservation District
Department of Conservation
Watershed Coordinator Grant Program
Permit Coordination for Environmental Enhancements
RCD: (530) 934-4601 x4; www.glenncountyrcd.org

Napa County Resource Conservation District
Department of Conservation
Watershed Coordinator Grant Program
Enhancing a Watershed
RCD: (707) 252-4188

Stockton East Water District
Department of Conservation
Watershed Coordinator Program
Community Building for Watershed Health
District: (209) 948-0333

Tehama County Resource Conservation District
Department of Conservation
Watershed Coordinator Program
Building Relationships to Build a Better Watershed
RCD: (530) 527-3010 x120; www.tehamacountyRCD.org

Westside Resource Conservation District
Department of Conservation
Watershed Coordinator Program
Rainfall, Tamarisk, and Tree Propagation
RCD: (559) 647-9198

The Farm Security and Rural Investment Act of 2008

The current reauthorization of the Farm Bill (2012) awaits action by Congress. The reauthorized federal 2008 Farm Bill provides several new and traditional agricultural conservation programs that exemplify an agricultural land stewardship strategy. All programs are voluntary. Many programs may include technical assistance, financial incentives, or temporary and permanent set-aside payments for various purposes.

California Agricultural Water Stewardship Initiative (CAWSI)

CAWSI raises awareness about approaches to agricultural water management that support the viability of agriculture, conserve water, and protect ecological integrity in California. This effort of the multi-stakeholder group, the California Roundtable on Water and Food Supply includes an online resource center of agricultural water stewardship practices and a host of additional useful resources. (http://www.agwaterstewards.org/)

California Rangeland Water Quality Management Plan

In 1990, California's range livestock industry led by the California Cattlemen's Association developed a program of voluntary compliance with the Federal Clean Water Act, federal and state coastal zone regulations, and California's Porter-Cologne Act. This initiative led to the development of the California Rangeland Water Quality Management Plan (CRWQMP) for nonfederal rangelands, which was approved by the State Water Resources Control Board in 1995. The management plan provides for development and implementation of ranch water quality plans on a voluntary basis. In 1994, UC Cooperative Extension (UCCE) and NRCS began to develop education programs to support landowners in the development of individual water quality management plans. These plans focused on nonpoint source assessment, development of water quality protection objectives, implementation of practices, and monitoring in the short and long-terms. Several workshops targeting landowners have been conducted throughout the state by UCCE. The program has been effective; the majority of ranchers who developed management plans went on to implement best management practices (BMPs).

Payments for Watershed Services

A new voluntary, market-based mechanism that funds conservation easements and or conservation practices on private lands for watershed services (i.e., to protect water sources and maintain and improve water quality). These programs include one or several buyers (public agencies, private companies, non-profits, consumers). Several of these programs are being implemented in the U.S. and in California.

Potential Benefits of Agricultural Land Stewardship

Agricultural land stewardship should be included as an integral component of regional integrated resource planning, including watershed planning and implementation. Agricultural land stewardship can use stewardship practices to protect the health of environmentally sensitive land, recharge groundwater, improve water quality, provide water for wetland protection and restoration, reduce costs to the state for flood management, and aid riparian reforestation and management projects. Land can also be managed to improve water management, urban runoff control, water storage, conveyance and for groundwater recharge. These stewardship practices are attractive since they do not rely on construction of major facilities and provide a range of environmental co-benefits.

Agricultural Land Stewardship Can Be Part of A Regional Strategy of Urban Growth Management

Agricultural land provides public benefits for floodplain management, scenic open space, wildlife habitat, and defined boundaries to urban growth. Stewardship provides the rural counterpart to urban efforts to encourage more water efficient development patterns. It also can minimize fragmentation of agricultural land by development that can decrease productivity and decrease the provision of ecosystem services.

Climate Change

Climate change is anticipated to result in increased average temperatures and changes to hydrology, which will have many direct and indirect impacts on agriculture in California. These impacts include a reduced snowpack, decreased water availability, increased evapotranspiration, and more intense flood events and droughts (DWR, 2008). Climate change will lead to increased evapotranspiration and moisture deficits during potentially longer drought periods, concurrent with increased water demand (DWR, 2008). Agricultural land stewardship provides both mitigation (reduction of overall impact) as well as adaptation (preparation for unavoidable changes) benefits in relation to climate change.

Adaptation

Stewardship of agricultural soils improves capacity to retain water and promotes resilience to dry periods. Likewise, soils that are rich in organic matter absorb water better which will be beneficial during unusually high rainfall events that are anticipated under a changing hydrologic regime. Increasing flexibility in cropping patterns will be important in a more variable climate which may entail loss of freeze days and a longer growing season. The protection of small patches of wildlife habitat on portions of cultivated or fallowed land would provide multiple climate adaptation benefits such as providing habitat for pollinators and refugia for other species that may need to migrate across the landscape to find suitable habitat. Higher temperatures and dryer conditions will lead to increased wildfires in some parts of California. Grazing and brush management on rangelands can be used to reduce the risks of wildfire and subsequent impacts to watersheds and downstream agricultural land.

Mitigation

Mitigation is accomplished by reducing or offsetting greenhouse gas emissions in an effort to lessen contributions to climate change. Agricultural land stewardship is a valuable mitigation tool. Energy conservation measures associated with agricultural land stewardship lead to a direct reduction in the production of greenhouse gas emissions, and practices that encourage soil sequestration take carbon out of the atmosphere while protecting soils that will be subjected to an increasingly variable hydrologic regime in the future. On-farm management of green waste and other soil-building practices can retain carbon and nitrogen within the soil, benefitting both tilth and overall soil health while sequestering greenhouse gases. Enhancing soil organic matter also increases water retention in soils, thereby reducing additional energy spent through irrigation. Conservation tillage reduces on-farm energy use, while improving soil organic content and carbon sequestration. On-farm power generation through anaerobic digestion, photovoltaic panel installation and wind turbines reduces the use of greenhouse gas intensive fossil fuels. Developing on-farm water sources, such as ponds, reduces the energy required for pumping ground water. In rangelands, management practices such as prescribed grazing and management of woody vegetation have the potential to increase carbon sequestration. (See practices listed in Table 20-1))

PLACEHOLDER Table 20-1 Annotated List of Agricultural Land Stewardship Best Management Practices (by Resource Issue Addressed and Hydrologic Regions of Greatest Applicability)

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Provide Water Supply Benefits

Agricultural land stewardship includes wise management of water for on-farm application, for groundwater infiltration, and for downstream users. Because of their geographic location rangelands play an essential role in the supply of surface water in California. By keeping healthy riparian areas and adequate plant cover rangelands are able to capture rainfall and prevent erosion and runoff. Vegetation management practices such as brush control and invasive species control can improve hydrological conditions and increase water supply. As agricultural lands are converted to urbanization the capacity of the land to capture and release water slowly decreases so there is more runoff and less recharge.

Improve Drought Preparedness

Agricultural land stewardship includes practices to promote local sufficiency and sustainability. Local sufficiency and sustainability are improved through wise management of surface water and groundwater. Well-managed supplies of local groundwater can be a cost effective solution to drought preparedness. During times of drought, and at times when operating constraints prevent the delivery of allocated water supplies, landowners conserve available water by using local groundwater, reducing cultivated acreage (fallowing), shifting crops to lower water consuming crops, building the water retention capacity of soils, installing irrigation ponds to capture winter stormwater, and by such practices as stumping a portion of trees in an orchard to maintain high quality for a reduced yield. In rangelands, high root biomass of grasses can enhance water infiltration (and decrease runoff), and range management practices that increase soil organic matter increase the water retention capacity of soils.

Operational Flexibility and Efficiency

Agricultural land stewardship includes partnerships for water management to promote flexibility and efficiency in operations. Water banks, water loans, water transfers, conjunctive management, causeway farming, and other land management practices can contribute to operational flexibility and efficiency.

Reduce Flood Impacts

Managed lands are essential for flood management. By allowing floodwaters to spread, dissipating energy, sediments are retained as soil on the landscape. Stewardship of agricultural land protects developed land while preserving productivity.

Environmental Benefits

Agricultural land stewardship uses adaptive management to improve efficiency, reduce energy consumption while maintaining working landscapes, habitat, and open space. In addition to these direct environmental benefits of agricultural land stewardship, farmlands proximate to urban populations can benefit the environment by providing local sources of food requiring less transportation and storage, thereby conserving energy and land, while reducing greenhouse gas emissions produced in transport and storage of fresh produce. California's rangeland ecosystems are important for species conservation because they are the most species-rich in California, with more than 300 vertebrate, 5000 invertebrate, and 2000 plant species (Allen-Diaz et al. 2007; Barrett 1980; Garrison and Standiford 1996; Verner 1980).

Energy Benefits

Agricultural land stewardship practices and strategies can reduce the use of energy on working land, as well as produce resources that can be used directly, or after processing, to create new energy. These practices include: conservation tillage to reduce farm implement energy use; photovoltaic installation to power farm equipment; switching to different equipment that uses less or less polluting energy; developing on-farm water sources, such as ponds, to reduce energy required for pumping water to farm and crops; improve soil moisture retention capacity by increasing soil carbon, reducing energy required for irrigation; composting, fermenting or burning of agricultural waste to generate kinetic energy from latent energy for use on-farm/ranch or sale to the energy grid; growing of energy crops on existing cropped land to produce renewable befouls, such as bodies and ethanol. Solar and hydroelectric energy production may be compatible with farming operations.

Recreational Opportunities

Working farms and ranches preserve open spaces which are both the backdrop and the source of recreational opportunities. Many open space areas open for public recreational activities are greatly enhanced by virtue of being surrounded by the open spaces of working farm land. Waterfowl, game, and fisheries are all found in conjunction with well-managed agricultural land. Increasingly, connector trails between public land pass through land maintained in agricultural vitality. Several areas used for public recreation in California are managed through grazing to enhance habitat for native plants and wildlife, reduce invasive species and decrease wildfire risks.

Reduce Groundwater Overdraft

Agricultural land is in the forefront of groundwater management. Opportunities to manage and store groundwater supplies continue to improve the long-term operational flexibility of total water supplies in wet and dry times.

The Social Equity of Agricultural Land Stewardship

Proper application of agricultural land stewardship can reduce off-farm impacts to residents of rural communities, through protection of soil, air, and water resources, as well as by providing meaningful jobs producing agricultural commodities.

Food Security

Provision of a safe, nutritious, affordable, domestic food supply.

Potential Economic Costs of Agricultural Land Stewardship

Governmental and nongovernmental entities are seeking ways to secure funds for conservation practices that can be part of stewardship. In general, there is agreement by economists on three questions (1) what are the direct costs for supporting stewardship programs? (2) what are the common ways to measure the costs for the wide range of environmental values? and (3) what current level of investment is needed to sustain stewardship for the long term?

Developing stewardship costs is similar to estimating costs of managing land to avoid environmental impacts such as air and water pollution, or to provide wildlife habitat or secure food and fiber production.

Stewardship is a way of doing business and it should be a part of an economic model that shows a return on investment by placing a value on healthy communities and their quality of life. In addition, agricultural land stewardship helps avoid costs associated with urban land use. It is difficult to quantify the costs that are prevented by agricultural land stewardship. Not only are there cost savings by avoiding expansion of infrastructure, but there are avoided costs for flood damage reduction measures and urban runoff. These costs have not been quantified for broad reference and application.

Some legislative proposals are seeking to provide annual payments for conservation benefits that may be part of private land management programs. Experience and recent trends suggest that many California agricultural land owners may participate in some agricultural land stewardship programs if the annual rents they receive are about $100 to $200 per acre. A survey of ranchers in California shows that they are very interested in participating in market-based programs to provide ecosystem services. Based on a Department of Water Resources (DWR) preliminary estimate, agricultural land stewardship practices in California could cost about $5.3 billion by year 2030.

Costs of implementing agricultural land stewardship will be dealt with in at least three ways:

1. Actual costs of best management practices where those have been documented in recent studies or project, or by conservation or agricultural agencies, such as the USDA Natural Resources Conservation Service. Costs would be expressed in terms of dollars per acre or mile, for example, or for installation of a structure.
2. A range of costs based on past experience or range of levels of implementation of an agricultural land stewardship practice or strategy. An example would be the cost of agricultural easement acquisition, which would vary from place to place in California, and would also vary based on the extent of property interests purchased by an easement agreement (e.g., just development rights, or development rights, plus flowage rights including restrictions on crops that can be planted under the easement agreement).
3. Cost estimates in reports and studies of solving a resource issue in a region or statewide. An example might be a State agency's estimate of the current cost of installing riparian buffers to protect water quality on high priority water bodies in a particular State Water Quality Control Board's region.

Sources of Agricultural Land Stewardship Assistance

In narrative and table form, sources of three kinds of assistance available to State and regional water management program managers will be described. The focus will be to provide a resource for Integrated Regional Water Management Plan managers, for both active and prospective plans. Table 20-2 will be used to support a narrative description of sources of information and data, "boots on the ground" technical assistance, technical advice, and financial assistance (grants, loans, cost-share, and in-kind). The table will list public or private non-profit agencies that provide assistance, kinds of assistance, examples of applications, and contact information of providing organization.

PLACEHOLDER Table 20-2 Examples of Sources of Informational, Technical, and Financial Assistance for Agricultural Land Stewardship

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Major Issues Facing Agricultural Land Stewardship

There are major issues related to improving agricultural land stewardship include mixing economic endeavors with environmental goals and economic markets and land conversion. Increased focus on this strategy is necessary to implement regional integrated resource planning and management, and demonstrate to the public the measurable benefits of stewardship. Land use change is a critical issue, as conversion from agriculture to urban and industrial land use can result in irreversible loss of a landscape's potential to provide food and multiple ecosystem services that the public benefits from. Every year about 20,000 acres of rangelands are converted to other uses, negatively impacting water provisioning, conservation of biodiversity, and open space.

Resources Needed to Support Agricultural Land Stewardship in California: A Gap Analysis

The needs for agricultural land stewardship in California, and the resources and policies available to support them, do not match. This section will review in very general terms where the gaps exist in terms of financial and technical assistance, data/information, research, and policies. The major providers of conservation support to private landowners—the US Department of Agriculture's Natural Resource Conservation Service, the State-authorized local resource conservation districts, and the California Association of Resource Conservation Districts—are among a handful of State, federal and local government and private non-profit conservation organizations that will be tapped for information on the gaps. This will be a qualitative discussion, supplemented with quantitative analyses where they exist.

Duplication and Lack of Coordination of Resources to Support Agricultural Land Stewardship

This includes not only duplication and coordination issues among assistance programs, but also the lack of coordination between regulatory drivers of conservation and the programs available to help landowners respond.

Landowner Confidentiality and Privacy Protection

Many environmental regulatory programs understandably require information from working landowners about the effectiveness of grant funding made to help landowners comply with regulations. The issue has at least two facets. First, agencies have a responsibility to account for the expenditure of public funds to achieve resource protection and conservation. Second, there is an enforcement and scientific need for data on the effectiveness of agricultural land stewardship practices that are funded. These data are needed to document compliance, but also to document value of agricultural land stewardship practices to the conservation objectives of the regulatory agency. For example, the State Water Resources Control Board has required farm-specific information as part of the public record of its agricultural water quality grant programs. Besides the vulnerability that farmers and ranchers feel from other regulatory programs that might use the information, the requirement conflicts with USDA's conservation assistance programs and may prevent better leveraging of funds and coordination among agencies with similar goals of agricultural land stewardship.

Leadership

Most states maintain a state council or similar leadership and coordinating body that provide guidance to federal, state, and local programs to achieve agricultural land stewardship. Some have regulatory or oversight authority over local conservation work that uses state and federal funding; others simply set state goals for conservation and serve as a venue for coordination and problem-solving for state programs as well as local conservation entities, especially resource conservation districts.

California once supported a Governor-appointed Resource Conservation Commission that served primarily in the former capacity. The commission failed to keep pace with the changing paradigms of conservation, including the definition of conservation, the move from structural solutions to bioengineering technologies. The commission, though still authorized in State statute, has ceased to operate due to a lack of funding and commissioner appointments. The California Association of Resource Conservation Districts, among others, has called for the re-creation of at least a State conservation advisory council. Based in part on the positive experience with the now-historic CALFED Bay-Delta Program Working Landscape Subcommittee, the Secretaries of Natural Resources and Food and Agriculture agencies explored the creation of a working land stewardship council made up of stakeholders and agencies to identify and pursue coordinated initiatives in support of agricultural land stewardship. To date, no such State leadership body exists. The California Watershed Council may help to fill this void.

Underserved Agricultural Land Stewardship Stakeholders, Communities, and Regions

For a variety of reasons, including language barriers, the remoteness and size of communities that affect their capacity to be heard, some landowners, communities, and regions may not receive the share of agricultural land stewardship resources that is warranted by their agricultural land stewardship resource problems. This section will draw upon existing documents to explore this issue.

Regulatory Barriers to Agricultural Land Stewardship, the Burden of Bureaucracy, and Regulatory Assurances

There is an ongoing need for interagency coordination and alignment of policies and regulations, to clarify regulatory barriers, reduce unnecessary burden of multiple bureaucracies, and provide greater regulatory assurances.

Federal, State, and local regulations and permits may present crippling barriers to agricultural land stewardship. The issue may simply be the time, complexity and cost of complying with regulations relative to the agricultural land stewardship benefits to be achieved. The issue may be the costs and bad fit of regulations resulting from the application of regulations intended for urban land uses and settings to the rural conditions of the agricultural working landscapes. In at least a few circumstances, the application of one agricultural land stewardship practice may place a landowner in jeopardy with another environmental protection standard. The application of a conservation practice that could result in the “take” of listed Endangered Species Act species is one example.

Landowners often do not pursue available conservation financial assistance because of the amount of paperwork and process that they must go through to get the funding. This issue is often a problem of striking balance between funding accessibility and the need to be accountable to the public for the

effective and legal expenditure of funds. The liability that administrators face can lead to a cumbersome bureaucracy not commiserate with level of assistance being offered. In addition, farmers and ranchers may have an inherent mistrust of government entities which prevents them from participating in stewardship programs.

As previously noted, divulging personal or site-specific information to a granting agency can open a landowner to further regulatory liability. Similarly, there remains an issue that "no good deed goes unpunished" among some landowners, who fear that on-farm conservation, for example, can lead to the improved health in the population of a listed species, leaving the landowner at greater risk of Endangered Species Act sanctions. The issue is the need for more and easier-to-employ opportunities for regulatory assurances that good conservation deeds will not be punished, but rewarded.

Outreach and Demonstration

Cutbacks in UC Cooperative Extension Service, Natural Resources Conservation Service Environmental Quality Incentives Program (EQIP) education and demonstration funding and authority, among other reductions in conservation programs has left the success stories, and how they were achieved, untold. Too few working landowners are aware of the technical and financial assistance that is available to them. There are too few opportunities for landowners to see what their neighbors are doing that saves natural resources and even saves them money. Farm tours, tailgate sessions, workshops, and meetings out on the working landscape are needed to spread information and inspiration. There are good examples that with funding and staff assistance could be replicated. Otherwise, insufficient outreach, education, demonstration, and storytelling opportunities are barriers to agricultural land stewardship.

Some examples include: Stories of stewardship published by the US Department of Agriculture's Natural Resources Conservation Service, California Farm Bureau Federation, wildlife conservation agencies and organizations like Farming for Wildlife, the California Cattlemen Association and the California Rice Commission, the California Rangeland Conservation Coalition to name a few. Also, there are a growing number of agricultural land stewardship-consistent workshops and training sessions being sponsored sporadically around the state, such as by the UC Small Farm Center; county-level farm marketing associations such as PlacerGROWN in Placer County, the EcoFarm Conference in Asilomar each winter, and others. It is hoped that review of this annotated outline will result in other examples that can be highlighted.

Measuring Performance of Conservation

There is a need to develop metrics and standards to measure and evaluate the efficiency and efficacy of stewardship practices. Metrics need to balance the need for accuracy (i.e., scientifically based and practicality so they are simple to use and inexpensive.

Documenting Performance of Conservation

The focus being on the need for information that makes it clear to funding organizations and landowners that agricultural land stewardship practices are worth the investment; e.g., the practice will clean up the water enough to meeting regulatory standards or the personal stewardship goals of the landowner.

Food Safety and Co-management

The September 2006 outbreak of E.coli O157:H7 in the Salinas Valley galvanized the grower community and the food processing industry to orchestrate intensive efforts to prevent crop contamination by developing and implementing rigorous food safety programs. However, some food safety programs conflict with environmental goals by targeting the elimination of wildlife and habitat, and removal, or discouragement, of conservation practices intended to improve and protect water quality by attenuating sediment, nutrients, and pesticides in tailwater and stormwater runoff (e.g., vegetative filters, grassed waterways, constructed wetlands, etc.). State and federal public funds have supported growers efforts to develop Farm Water Quality Plans and implement conservation practices (e.g., Farm Bill/Environmental Quality Incentives Program, Clean Water Act - section 319 Nonpoint Source Program grants, etc.). Many farmers are required to comply with regulatory mandates (e.g., the regional water quality control boards' irrigated lands regulatory program) and implement best management practices to reduce, control, or prevent pollution. The Food & Drug Administration is expected to promulgate federal food safety regulations in 2012 which places emphasis on the co-management of food safety and environmental requirements to avoid conflict.

Energy Crops and Climate Change

The market and our national and state leaders are encouraging growers to plant energy crops, such as corn and soybeans. While these crops have increased the profitability of farming in many regions, the new cropping patterns can also lead to increased cultivation of new land, higher use of fertilizers and volatile organic carbons for pest management, thereby increasing energy use and greenhouse gas emissions. Cropping and ranching practices that sequester carbon, on the other hand, are best suited to the production of cellulosic ethanol, whose technology is not yet developed for commercial scale use.

Floodplain Protection and Farming

The working landscape approach to agriculture often advocates the use of agricultural conservation easements to keep land in private ownership and management, while permanently removing the development rights from the land and altering farming and ranching practices to those compatible with floodplain management. Among the common easement restrictions is the limitation on types of crops grown to crops that will not impede floodflows or lead to excessive crop loss claims. As such, flood easements often prohibit the planting of high value and flow-impeding permanent tree and vine crops. Farmers who may otherwise be interested in flood easements may be reticent to participate knowing that their “palette” of crops available to respond to market opportunities will be limited. Increased implementation of “flood-friendly farming” can reduce the inherent conflicts between floodway easements and reliable crop production. Additional information on floodplain protection can be found in the Flood Risk Management Resource Management Strategy.

Water Conservation and Water Rights

The conservation of water on agricultural land, depending on the nature of water contracts and rights, could result in the loss of water availability. For example, conservation of water could lead to a base of water use that may be used in the future for calculating cutbacks in water allocations. Conserving farmers and ranchers could find themselves in a position that their water allocation during a drought is not sufficient to meet minimum crop needs.

Water Transfers

Increasingly, idling of agricultural land for the temporary or permanent transfer of water or water rights is a strategy to meet urban and environmental water needs in times of shortage, an increasingly normal condition with climate change and population growth. Idling of cropland can result in a degradation of soils from salt accumulation absent the leaching fraction component of irrigation, erosion, or invasive plant species. Strategies are needed that integrate water transfers with crop rotation/agronomic fallowing, soil-building schemes that also provide conjunctive wildlife habitat benefits. Additional information about water transfers can be found in the Ag Water Use Efficiency Resource Management Strategy and the Water Transfers Resource Management Strategy.

Agricultural Conservation Easements are Forever

There is a growing awareness of the need for agricultural conservation easements to protect land from the fragmentation of agricultural landscapes into parcels too large to mow and too small to farm. Yet, producers often loathe giving up their future "retirement account" of subdivision potential forever. Ways to enable producers to use easements as an aid to financial and estate planning are available, but too few producers are aware of them. One example is the use of clustering development to gain development value income while protecting the bulk of the land for agriculture in ways that do not impede surrounding agricultural uses or exacerbate the provision of urban services by cash-strapped counties.

Farm Market and Economic Considerations

The three legs of sustainability include economic, environmental, and social equity sustainability. A growing body of environmental, labor, food safety, land use and other regulations has increased the cost of doing business in California. Land costs have increased as demand for housing and open space uses compete for land. Trade liberalization and international competition from developing countries with lower labor costs and regulatory standards has driven up the prices California producers can command in the marketplace. These and other factors make their choices to invest in agricultural land stewardship practices difficult. Finding market value for the environmental services Californians demand from agriculture is one key to keeping California working landscapes profitable and sustainable. These services include improved wildlife habitat, clean and more abundant water supplies, places to spread floodwaters, recreation, scenic open space, energy, carbon sequestration, groundwater recharge and clean air.

Landowner Concerns

Landowners are concerned that environmental programs that help them improve habitat might attract more threatened and endangered species affecting landowners' use of land. Thus some landowners are reluctant to be involved with government agencies, even though some of these agencies might help landowners to comply with real regulatory requirements.

Federal Endangered Species Act assurances can only be granted by the US Fish and Wildlife Service and the National Marine Fisheries Service. In order to determine what type of species must be covered and possible protective measures that may be required, surveys are necessary to determine what species are present. This only increases landowner concerns that they will be subject to increased restrictions if the presence of endangered species is verified on their property.

Some landowners question how they can adequately maintain their privacy and, at the same time, satisfy the public need for information of farm activities supported by public resources. In addition, there is landowner confusion regarding what type of assurances can be provided. One perspective is that the economic return from certain land stewardship programs may often be less than the return from other options for land use, especially when urban development is an option.

Lack of Information

There is a lack of scientific, economic, social and environmental studies and monitoring of agricultural land stewardship programs to evaluate their merits for ecosystem restoration, water quality, and agricultural economics for large and small agricultural operations. There are conflicting reports about the compatibility of certain agricultural land stewardship and ecosystem restoration programs. There is a need to invest in research to address these issues. In order to justify public investment in stewardship, there must be accountability in terms of monitoring.

Complex Regulations and Programs

Institutional regulations and programs are complex and sometimes conflict. Agricultural landowners may be discouraged when developing a stewardship program for multiple purposes such as water and soil conservation, ecosystems restoration, floodplain and wetlands management, water quality and land use planning. The regulations may seem intrusive to the private landowner but essential for those responsible for environmental protection and restoration programs.

Federal Funding

California has traditionally received proportionately less funding for the federal Farm Bill's conservation provisions relative to its agricultural standing, the value of the threatened resources and the population served, and the interest of the landowner community. Although California farmers and ranchers provide more than 13 percent of the nation's food and fiber, they historically receive less than 3 percent of federal farm conservation funding. Commodity support programs influence stewardship management. California is dominated by specialty crops rather than traditional price-supported commodity programs. The funding inequities of the Farm Bill will become increasingly apparent in the future as production of California cotton, alfalfa, irrigated pasture, and possibly rice decreases and as specialty crops increases.

Regional Cooperation

The effectiveness of agricultural land stewardship depends on having a sufficient number of landowners implementing conservation practices within a watershed. Without regional cooperation, private landowners may be frustrated in reaching their management goals by adjacent operations or watershed activities that do not contribute to better management for environmental functions and values. These values include protecting and reestablishing riparian corridors or water quality within a watershed. Watershed Stewardship is an approach that can help build partnerships, increasing overall success of conservation practices within a watershed. The Watershed Stewardship Resource Management Strategy addresses these concepts in greater detail.

State Policy Goals

In general, land use is a local planning issue subject to local regulation. Statewide planning goals or restrictions may be seen as an intrusion on local governmental powers. If the conflict is between private

property and public commitments, then many landowners prefer programs such as the Williamson Act because these are temporary land-use restrictions that landowners can ultimately "opt out" of if they later decide to sell land to development and the asking price justifies the cancellation penalty. As a result, many landowners are wary that they may lose future economic opportunities by committing to permanent restrictions. Likewise, the public may be unwilling to fund the necessary incentive (rental, technical assistance, etc.) programs essential to successful stewardship without a clear understanding of long-term benefits from such programs. The California Department of Food and Agriculture has sponsored an Ag Vision Advisory Committee, leading to the development of the California Agricultural Vision Reports (December 2010 and Spring 2012). These reports can be obtained from the CDFA web at http://www.cdfa.ca.gov/agvision/.

Changing Demographics of Farmers, Farms

As agricultural land stewards age, and lacking a new generation of farmers to take the reins, there is a shift away from mid-sized farms toward large and small farms, the former sometimes held and managed by commercial interests with non-resident managers, the latter being a collection of smaller boutique farming operations. Mid-size, owner operated farms, meanwhile, are vanishing. At the same time, some farming families are diversifying, creating vertical integration of production, processing, packaging, marketing, with the new generation filling both the administrative and farming roles.

Recommendations to Promote and Facilitate Agricultural Land Stewardship

I. Recommendations for State Action

A. Institutional and Leadership Recommendations

1. The Natural Resources and Food and Agriculture Secretaries, in consultation with the California Board of Agriculture, US Environmental Protection Agency, Department of Interior, US Department of Agriculture, Department of Commerce, and National Oceanic and Atmospheric Administration, should assess agricultural land stewardship assistance, information and regulatory programs, their effectiveness and level of coordination. This assessment should be done by the end of 2010. The Performance measure is the completion of the assessment report that addresses the issues listed below.
   A. The assessment should address the need for better coordination between regulatory and assistance programs as well as between assistance and information programs of both State and federal agencies. Recommendations should include mechanisms for improving coordination among State assistance programs; opportunities for leveraging State, federal, and local resources to address agricultural land stewardship issues on a local and regional basis. Recommendations should also address ways for voluntary assistance programs to better help producers meet State resource regulatory mandates. The latter recommendations should include actions for better coordination between State and federal assistance and regulatory programs.
   B. The assessment should address the need for a statewide agricultural land stewardship leadership and coordination entity, such as a governor-appointed council or the reinvention of the former Resource Conservation Commission.
   C. Measures to assure implementation of findings should be included in assessment mandate.

D. State and federal agencies should work with stakeholders to develop and implement payments for ecosystem services programs that compensate landowners for their stewardship while reducing the cost of regulatory compliance and delivering measurable conservation benefits

B. Regulatory and Process Recommendations

2. State funding and staff should be made available through collaboration with the US Department of Agriculture's Natural Resources Conservation Service, state Resource Conservation Districts and appropriate non-profit conservation organizations to develop one-stop shop local and regional-level permit coordination and assistance programs. California Environmental Protection Agency and the Natural Resources Agency should implement this recommendation through use of bond funds, redirection of staff and use of existing local capacity-building programs such as the Department of Conservation's Watershed Coordinator Program. This recommendation should be implemented immediately. Performance measures include reduced cost, time and liability for landowners to implement agricultural land stewardship practices and strategies.
3. State Resource protection regulations should be amended to allow qualified third party verification that grant funding to assist landowners in complying with regulations is spent appropriately and effectively, and to collect monitoring data in a manner that protects landowner confidentiality and enables federal participation in conservation actions that assist with regulatory compliance and the development of data on the effectiveness of agricultural land stewardship practices. Regulatory agencies, particularly the Air Resources Board, the Regional Water Quality Control Board and the Department of Fish and Game should assess regulations and need for amendments in the near term, and propose changes for mid-term achievement of this recommendation. Performance measures would include greater State and federal collaboration in assisting landowners in meeting regulatory requirements; sufficient data on the effectiveness of agricultural land stewardship practices in meeting resource protection regulatory requirements; and an increased level of participation among private landowners in State grant programs intended to assist regulatory compliance.
4. The Natural Resources Agency is facilitating the development of a Bay-Delta Conservation Plan and the California Department of Fish and Game's Natural Community Conservation Plan to provide regulatory assurances and incidental take permits for water agencies to pump water from the Delta while also implementing a conservation plan to protect Endangered Species Act-listed fish species. The Natural Resources Agency and Department of Food and Agriculture should offer similar leadership as needed to implement Integrated Regional Water Management Plans where agricultural land stewardship is a key component of the regional plans. This is a mid-term recommendation pending adequate staff resources and bond funding availability. A performance measure would be increased implementation of agricultural land stewardship practices that improve terrestrial and aquatic habitat and species diversity.
5. Integrate responses to the overlap of existing and forthcoming regulations on climate change, flood control, air and water quality, biodiversity protection, etc., to achieve greater adherence and efficiencies.

C. Financial and Technical Assistance Recommendations

6. A partnership between the Natural Resources Agency, the Department of Food and Agriculture, and the US Department of Agriculture's Natural Resources Conservation Service should be formalized to build on existing needs assessments to perform a gap analysis of agricultural land

stewardship needs and existing program resources to meet them. The analysis would become the basis for development of a strategy for the use of existing and new bond measure funding, existing General Fund conservation programs and federal conservation programs to fill the identified gaps. The analysis and strategic funding plan should be conducted under the leadership structures recommended in A(1), above. The analysis and strategy should be conducted pursuant to an executive directive or via a legislative proposal, or both immediately, with a product completed before the next water plan update. The performance measures would be increased funding for agricultural land stewardship top priority resource issues; increased State and federal coordination of funding; and better information upon which to allocate available funding to meet the most important agricultural land stewardship needs of California.

7. The Natural Resources Agency, the Department of Food and Agriculture and the California Environmental Protection Agency should establish a Farm Bill Interagency Agreement under which California establishes an ongoing presence in the debate over conservation provisions of reauthorized Farm Bills, and in the annual appropriations of funding for conservation to meet the needs of California as identified by the assessment and strategy of recommendation (6), above. This recommendation should be carried out after consultation with the Natural Resources Conservation Service and appropriate farm and conservation interest groups and non-profits. The interagency agreement should be consummated immediately, building on the current collaboration over the reauthorization of the 2002 Farm Bill. In this spirit, a collaborative, inter-agency letter was prepared and submitted regarding the pending 2012 Farm Bill.
8. The Governor should establish a coordinated conservation easement acquisition program that is based on a preference for maintaining working land in private ownership using conservation easements. Currently, there are a number of State and federal easement programs for wildlife, agricultural land, grasslands, forestlands, floodplains and scenic and recreational open space. These programs need better coordination to assure that the highest priority resource lands are protected and that the lands protected are conserving multiple values at once. The funding gap analysis and strategic plan should include an identification of needs for resource land acquisition programs and seek State bond and federal farm, highway and wildlife easement funding to acquire the highest priority agricultural land (among others) that also help to accomplish drought preparedness and flood management goals. This executive action should occur immediately, tied with the implementation of recommendation (6), above.
9. Funding for agricultural land stewardship programs should be made available on a voluntary participation basis, but with allocation of funding based on priority conservation needs (recommendation (6) above) and regulatory compliance needs. Financial and technical assistance should be in the form of grants, cost-share, regulatory relief and tax incentives. Most financial and technical assistance should be contingent on a meaningful and feasible level of landowner contributions.
10. Relevant agencies should explore the feasibility of a coordinated statewide effort to develop on-farm irrigation ponds that provide offstream capture of winter storm water for summer use. Evaluate current pilot pond projects, obstacles to broader adoption, and benefits for economic viability, local water supply, watershed management, flood control, groundwater recharge, mitigation of climate change, wildlife habitat, etc. Pilot projects for these types of efforts have been sponsored by the Roundtable for Water and Food Supply, as well as the Roundtable for Ag and the Environment.

D. Data and Research Recommendations

11. The US Department of Agriculture's Agricultural Resource Service, U.C. Cooperative Extension, and the US Department of Agriculture's Economics Research Service should conduct cost-benefit analyses for agricultural land stewardship practices, in particular new and emerging strategies such as keylines and dry farming. California State government leaders should request that funding be directed or appropriated from the federal and State budgets to conduct such research. This is essential research if limited conservation assistance funding is to be spent effectively. Further, if a regulatory approach to working landscapes natural resource issues is to be collaborative, depending on conservation planning and the use of certified best management practices, regulators should be assured that practices employed to improve water and air quality or improve biodiversity are documented as effective. Recently, the University of California at Davis and the US Department of Agriculture's Natural Resources Conservation Service have collaborated to document the costs and benefits of conservation tillage systems. This research should be implemented immediately. Performance measures should include increased confidence in agricultural land stewardship practices as exemplified by greater State and federal funding to support their use by growers; and, increased use of certification programs to assist growers in complying with environmental regulations.
12. Agricultural, conservation and food safety organizations and agencies should continue to identify and support needed research on the causes of food contamination to determine the extent to which agricultural land stewardship practices may play a role in causing or resolving the contamination. When research identifies food contamination risks from conservation practices, further research should be supported to adapt existing or develop alternative conservation practices that protect water and air quality, for example, while lowering the risk to food safety. Identification of research needs should be continued under the leadership of the University of California and industry and funding found immediately to support research and extension. Performance measure known risk of common conservation practices; reduction of risk from modified or alternative conservation practices (enumerating risks is progressive, adaptive management). Performance measure: known benefits of common conservation practices; increased, widespread adoption of conservation practices that contribute to food safety.
13. The US Department of Agriculture, California Department of Food and Agriculture, California Energy Commission, and Air Resource Board and others should support research of agricultural land stewardship practices and strategies with respect to net greenhouse gas emissions and carbon sequestration, including the cultivation of alternative bio-fuel crops and use of agricultural residues. This research should be conducted immediately for application to agricultural land stewardship practices by the next Water Plan update. Performance measures: the application of agricultural land stewardship practices that reduce greenhouse gas emissions and increase carbon retention in the soil.

E. Climate Change

14. Recommendations of the Climate Action Team's agricultural work group should be incorporated into financial and technical assistance programs, particularly those of the US Farm Bill's conservation programs. Assistance programs should support only agricultural practices and crop systems that result in lower greenhouse gas emissions as determined by a life-cycle analysis of the carbon budget of a practice. The Climate Adaptation Resource Management Strategy provides additional information about this issue.

F. Floodplain Management and Agricultural Land Stewardship.

15. The Legislature and Congress should appropriate bond and Farm Bill funding, respectively, to continue floodplain protection easement programs that allow conjunctive agricultural uses. Allow as much flexibility for crop selection under easement agreements as possible to avoid limiting grower response to market signals thereby limiting profitability of farming. At the same time, growers should assume the risk of growing high value, permanent crops on flood easement-restricted cropland. The latter recommendation may require immediate changes to statutory or regulatory rules affecting floodplain easement programs. Performance measure: increased participation by growers in floodplain corridor protection grant programs. The Flood Risk Management resource Management Strategy provides additional details about this topic.

G. Water Conservation, Water Rights and Water Transfers

16. State and federal water providers should reward conservation by their customers through the use of conservation incentives in water delivery contracts, such as by increasing the water delivery priority to those producers practicing water conservation and agricultural land stewardship measures.
17. The Department of Water Resources and US Bureau of Reclamation should establish a water transfer oversight entity that assures that water transfers do not result in a long-term negative impact on the state's food production capacity, or adversely impact rural community economics. The protection of soil health and enhancement of wildlife habitat should be considerations in approving water transfers. For example, temporary crop idling for water transfers should be designed to contribute to a crop rotation system that includes fallowing to build soil moisture and organic carbon content, and provide conjunctive wildlife habitat for such species as the Giant Garter snake. Transfers should reserve sufficient water on transferring land in order to establish a cover crop. Performance measure: acres of land in rotational conservation fallow programs; amount of water not used (saved) for those acres during fallow periods.

H. Education, Demonstration and Outreach

18. The federal Farm Bill should be amended, and appropriations made, to support a return to farmer-to-farmer education, demonstration and outreach on successful conservation programs. The Environmental Quality Incentives Program once included funding for such work. This authority and needed funding should be returned to the Natural Resources Conservation Service as part of its conservation operations and technical assistance budgets. Every Farm Bill conservation program should include funding to not only document program effectiveness, but to share information about the programs and their supported practices with other growers through educational materials, field demonstrations and workshops. This recommendation should be implemented immediately and in the near and long-term as US Department of Agriculture's budget appropriations are made each year, and as Farm Bill reauthorizations occur every five or so years. Performance measure: A greater awareness among working landowners of conservation programs, and greater demand for US Department of Agriculture's conservation program funding and technical assistance.
19. State grants that support agricultural land stewardship should likewise include a requirement that each grantee document project success and share lessons learned and successes with other growers and granting agency managers. This recommendation should be implemented, as bond authorities allow, immediately. Performance measure: greater demand among stakeholders and

agencies for funding of effective agricultural land stewardship practices and strategies, and the requirement that such funding includes funding for demonstration and outreach.

20. The Department of Conservation's Farmland Conservancy Program's funding for planning grants should be expanded in support of recommendations 22 and 23 below. The Administration should work with the legislature to acquire bond measure appropriations that support the Conservation Farmland Conservancy Program, specifically for its planning grants. This recommendation should be implemented immediately and in the long-term as new bond measures are placed on the ballot. See performance measure for recommendation 22.
21. The Department of Food and Agriculture and the Department of Conservation should seek funding to support an interagency technical outreach team to facilitate the transfer of technology with respect to agricultural land protection via agricultural conservation easements. The team would work with county planners and agricultural commissioners by sharing information on innovative farmland protection programs and ordinances in other counties. The team would also educate landowners about the tax, estate planning, and other benefits of agricultural conservation easement. This recommendation could be implemented immediately through an interagency agreement and a minor reallocation of staff resources. Performance measures: transfer of successful agricultural land protection programs to other counties; a greater demand for agricultural conservation easements and the funding to purchase them.

II. Recommendations for Local Action

22. Integrated Regional Water Management Plan (IRWMP) applications for funding should embody agricultural land stewardship components where the region addressed by the plan includes agricultural land. This recommendation should be implemented immediately if it is not already. Performance measure: IRWMPs are comprehensive and integrated, including supportive agricultural land stewardship measures and strategies where appropriate.
23. Counties should adopt agricultural general plan elements and designate supportive agricultural districts that enhance agricultural land stewardship on high priority, productive agricultural land. These districts should focus regulatory assistance through county agricultural ombudsmen. These districts should also be the focus of local agricultural infrastructure investment, marketing assistance, and the development of agricultural land stewardship practices and strategies in cooperation with local, State and federal agricultural conservation entities. Districts should also be the focus of land protection instruments, such as the Williamson Act and agricultural conservation easements. Other strategies to enhance agricultural resources locally should engage such resource organizations as resource conservation districts, the American Farmland Trust, and Ag Futures Alliances (via Ag Innovations Network), and be integrated with IRWMP and Habitat Conservation Plans where appropriate. This recommendation should be implemented over the long-term as each county general plan is updated. Performance Measure: Number of general plans that include comprehensive plans for the sustenance of local agricultural working landscapes.
24. Local entities should look for alternative sources of funding for ag land stewardship such as payments for watershed services

Agricultural Land Stewardship in the Water Plan

[This is a new heading for Update 2013. If necessary, this section will discuss the ways the resource management strategy is treated in this chapter, in the regional reports and in the sustainability indicators.

If the three mentions are not consistent, the reason for the conflict will be discussed (i.e., the regional reports are emphasizing a different aspect of the strategy). If the three mentions are consistent with each other (or if the strategy is not discussed in the rest of Update 2013), there is no need for this section to appear.]

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